A

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Captrin

Section 184.____ Captrin

(a) Captrin is the common usual name for ***glycerides*** of linear saturated fatty acids primarily of chain length C_8 or C_{10}. The ingredient is obtained by the hydrolysis of coconut oil or palm kernel oil followed by the fractionation and separation of the desired fatty acids which are esterified with glycerin to form ***acylglycerols***.

(b) The ingredient meets the following specifications. A minimum of ***45%*** triglyceride not more than ***40%*** diglyceride and not more than ***10%*** monoglyceride. The range of weight percent of the fatty acids are as follows:

C_8	3-95%
C_{10}	3-95%

Free Fatty Acids as Oleic	not more than 0.05%
Esterified Fatty Acids,	
Other than Caprylic or Capric	***not more than 5.5%***
Saponification Value	285-360
Unsaponifiable Material	not more than 0.5%
Iodine Value	not more than 1.0%
Hydroxyl Value	***not more than 75***
Residue on Ignition (Sulfated Ash)	not more than 0.1%
Total Heavy Metals Content (as Lead)	not more than 10 ppm
Arsenic	not more than 0.5 ppm
Lead	not more than 0.1 ppm
Tin	***not more than 1 ppm***

[c] The ingredient is used as ***an acylglycerol*** with the following physical or technical functional effects as defined in Section 170.3(o)(8) emulsifiers, (14) formulation aid, (18) lubricant and release agent, (20) nutrient supplement, (24) processing aid, (27) solvents and vehicle, (28) stabilizers and thickeners, (3) surface finishing agent, and (32) texturizer.

(d) The ingredient used in food at levels not to exceed current good manufacturing practice in accordance with Section 184.1(b)(1). The ingredient may be used in the following types of foods as defined in Section 170.3(n)(1) baked goods, (3) beverages, (6) chewing gum, (9) confections and frosting, (10) dairy product analogues, (12) fats and oils, (20) frozen dairy desserts, (35) processed fruits, (37) snack foods, and (38) soft candy; except that the ingredient may not be used in standardized foods unless permitted by the standard of identity.

The ingredient is sold as a technical food ingredient and is not formulated or mixed with other ingredients by the manufacturer.

SECTION (i)
Description of the Substance

(a) Common or Usual Name: Captrin

Captrin is the proposed common name for the randomized ***glyceride*** of caprylic and capric fatty acids. The term Captrin confirms to acceptable ***glyceride*** nomenclature for ***glyceride*** naming, i.e. Stearin is an acceptable name for glyceride tristearate.

The name Captrin is not in conflict with any name in the published literature and it would not be confused or misleading to purchasers of food for which the ingredient would be used.

Other names used:

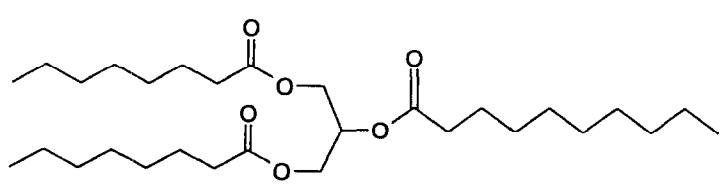
Caprocaprylin triglycerides
Caprylic/capric triglycerides
Caprylin
Neobee® M-5
Neobee® C-10
Medium Chain Triglycerides
Structural lipids

(b) Chemical Name: ***Glycerides, mixed decanoyl and octanoyl***

(c) Chemical Abstract Service (CAS) Registry Number: 73398-61-5
The components of Captrin have been assigned the following CAS Registry Numbers:

	CAS	Empirical Formula
Glycerides, mixed decanoyl and octanoyl	73398-61-5	
Glycerin	56-81-5	$C_3H_8O_3$
Caprylic Acid	124-07-2	$C_8H_{16}O_2$
Capric Acid	334-48-5	$C_{10}H_{20}O_2$
Octanoic acid, methyl ester	***111-11-5***	$C_9H_{18}O_2$
Decanoic acid, methyl ester	***110-42-9***	$C_{11}H_{22}O_2$

(d) Structural Diagram: Captrin has the general structural formula as shown below:



The fatty acids are randomly distributed on the glycerine backbone. The range of fatty acids is as follows:

n = 6 (caprylic acid)	3-95 weight percent
n = 8 (capric acid)	3-95 weight percent

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(e) Description:

Captrin is ***obtained by the esterification of fatty acids from coconut oil or palm kernel oil or their derivatives with glycerin to form acylglycerols***. Captrin has exceptional oxidative stability properties, a slightly yellow color, free of suspended matter with a bland taste and odor. The physical and solubility properties are such that the substance has unique technological functions in foods.

The ingredient that contains ***glycerides predominantly*** consisting of capric acid are solids or paste at room temperature, and those that consist predominantly of caprylic acid are liquid at room temperature.

(f) Specifications for Food Grade Material Including Arsenic and Heavy Metals:

The ingredient meets the following specifications. A minimum of ***45%*** triglyceride not more than ***40%*** diglyceride and not more than ***10%*** monoglyceride. The range of weight percent of the fatty acids are as follows:

C_8	3-95%
C_{10}	3-95%

Free Fatty Acids as Oleic	not more than 0.05%
Esterified Fatty Acids,	
Other than Caprylic or Capric	***not more than 5.5%***
Saponification Value	285-360
Unsaponifiable Material	not more than 0.5%
Iodine Value	not more than 1.0%
Hydroxyl Value	***not more than 75***
Residue on Ignition (Sulfated Ash)	not more than 0.1%
Total Heavy Metals Content (as Lead)	not more than 10 ppm
Arsenic	not more than 0.5 ppm
Lead	not more than 0.1 ppm
Tin	***not more than 1 ppm***

(g) Quantitative Composition: i.e., amount of each compound of the mixture and if any other materials used in the formulation the quantity should be given.

The ingredient is sold as a technical food ingredient and is not formulated or mixed with other ingredients by the manufacturer.

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(h) Manufacturing Process:

Captrin will be manufactured in accordance with the current good manufacturing practice regulations.

The manufacture of Captrin involves the esterification of fatty acids from coconut ***or palm kernel oil*** origin with glycerine to form ***acylglycerols***. ***Alternatively, glycerine may be transesterified with the methyl esters of fatty acids from coconut or palm kernel oil origins.***

List of starting materials:

Glycerine
Caprylic acid
Capric acid
Methyl caprylate
Methyl caprate

Specifications on starting materials – Quality of raw materials under in processing Captrin is warranted by the supplier. Each raw material receipt is analyzed for identity and purity. The raw materials and specifications are as follows.

Glycerine = USP, Meets Food Grade specifications in GRAS (21 CFR 182.1320), and meets the specifications of Food Chemical Codex, 3rd. Ed., p.136

Caprylic Acid = Purchased by specification, specifications and analytical methods are attached.

Capric Acid = Purchased by specification, specifications and analytical methods are attached.

Caprylic and Capric Acid = Mixture purchased by specification, specifications and analytical methods are attached. Chain-length distribution also included as specification.

Methyl Caprylate and Caprate = Purchased by specification, specifications and analytical methods are attached. Chain-length distribution also included as specification.

Chemical reactions – ***For esterification***, the reactor is charged with glycerine and the appropriate amount of caprylic and capric acid or mixtures of caprylic and capric acids depending upon the glyceride being produced. The esterification reaction occurs under nitrogen without added catalysts at elevated temperature.

Following the esterification reaction, vacuum is applied to remove excess acid. The reaction is neutralized with soda ash and dried under vacuum, cooled and filtered.

For transesterification, the reactor is charged with glycerine and the appropriate amounts of methyl caprylate and caprate along with a catalyst. The reaction is carried out under a nitrogen atmosphere at elevated temperature. Following the reaction, excess methyl esters are removed by vacuum distillation. The reaction is cooled and treated with activated carbon to remove the catalyst. The product is then filtered.

Finally, product made by either the esterification or transesterification route is steam distilled under reduced pressure in the process of deodorization. Deodorization removes any volatile compounds that may be present.

Addendum to Page 000008

BLOCK DIAGRAM: CAPRYLIC-CAPRIC TRIGLYCERIDES